

AMENDMENTS TO THE CLAIMS

Please cancel claims 1-7, and add new claims 8-18, as follows:

Claims 1-7 (Cancelled).

Claim 8 (New) A method for growing a thin bipolar gallium nitride film on a sapphire substrate, said method comprising:

subjecting the sapphire substrate to H₂ cleaning; and

treating the sapphire substrate, which has been subjected to H₂ cleaning, with a nitric acid solution having a nitric acid concentration of 6-63 %, wherein said treating is carried out at a temperature of 40°C for a period of 0 minutes to 10 minutes,

whereby the thin bipolar gallium nitride film having a Ga face (+c) and a N face (-c) is grown on the sapphire substrate.

Claim 9 (New) The method according to claim 8, wherein said treating is carried out for a period of 10 seconds to 10 minutes.

Claim 10 (New) The method according to claim 8, wherein said method further comprises: exposing the sapphire substrate to air before growing the thin bipolar gallium nitride film on the sapphire substrate.

Claim 11 (New) The method according to claim 8, wherein said method further comprises, after said subjecting and before said treating:

forming a mask on the sapphire substrate, whereby patterned regions having different polarities are formed in the thin bipolar gallium nitride film.

Claim 12 (New) The method according to claim 11, wherein the mask is formed from a photoresist.

Claim 13 (New) The method according to claim 8, wherein the sapphire substrate is a c face sapphire (Al_2O_3) substrate.

Claim 14 (New) A thin bipolar gallium nitride film device manufactured by the method according to claim 8.

Claim 15 (New) The thin bipolar gallium nitride film device according to claim 14, wherein the sapphire substrate is a c face sapphire (Al_2O_3) substrate.

Claim 16 (New) The thin bipolar gallium nitride film device according to claim 14 comprising a separated element.

Claim 17 (New) The thin bipolar gallium nitride film device according to claim 14 having a periodically patterned surface.

Claim 18 (New) The thin bipolar gallium nitride film device according to claim 14 comprising a separated element and having a periodically patterned surface.